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Differences in Peer Perception of Alcohol Use, Personal Alcohol Use, and Levels of Intoxication Among Students at Virginia Commonwealth University from 2002 to 2004.

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A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science at Virginia Commonwealth University.

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ABSTRACT

DIFFERENCES IN PEER PERCEPTION OF ALCOHOL USE, PERSONAL ALCOHOL USE, AND LEVELS OF INTOXICATION AMONG STUDENTS AT VIRGINIA COMMONWEALTH UNIVERSITY FROM 2002 TO 2004.

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This study involves the examination of National Collegiate Health Assessment (NCHA) data collected by the VCU Wellness Resource Center. This study will compare trends in college student health behavior perceptions and personal activity regarding alcohol use, as self-reported via the NCHA data, with a particular focus on a comparison between 2002, which is the year that the Wellness Resource Center (then known as the Office of Health Promotion) first implemented an alcohol education campaign based upon a "social norms" theoretical framework, and 2004, after 18 months of intensive campaigning. Thus, the aim of the project is to examine the changes in student behavior regarding alcohol usage and student perceptions in the prevalence of alcohol usage, after two years of social norms-based campaigning, while controlling for factors such as sex and place of residence. The measures that are analyzed are based upon the number of alcoholic drinks that students reported imbibing during the last time they socialized and

the number of alcohol drinks that the students reported to be what they considered the norm during such periods of socializing. This data is supplemented by a calculation of blood alcohol concentration (BAC), acquired through use of personal information that students reported on the NCHA, in order to more accurately describe student drinking behaviors.

CHAPTER 1

Introduction

The basic premise of Social Norms theory is that some behaviors tend to increase in frequency, not due to prevalence among a peer group, but because of the common misperception, referred to as “pluralistic ignorance,” by the majority that the behavior is prevalent. These misperceptions are fostered by the activities and claims of an openly visible minority, which has reached a “false consensus” regarding the popularity of their own behavior (Berkowitz 2004). Several universities have incorporated this theory into their health programs, particularly in the fields of drug/alcohol awareness and rape awareness. The basic application of the theory involves attempting to make the population aware of the actual frequencies of the targeted behavior, in an attempt to reinforce the "actual" norms and weaken the "misperceived" norm.

In summary, the Social Norms approach proposes that knowledge of the “actual” norms regarding a particular behavior will have two primary effects. It will reinforce the behaviors of those who are part of the “silent majority,” and it will cause those who deviate from the actual norms to adjust their behavior to more closely fit with the actual norm. The theory is important in that it attempts to provide an explanation for certain forms of group behavior. Applications of this theory thus have the potential to influence behavioral change on a wide scale.

The latter is of particular importance to health promotion agencies, as is shown by the numbers of Social Norms approach-based health promotion programs enacted on University campuses (Berkowitz 2004). While the body of available data, with a few

exceptions (Wechsler 2003 and Licciardone 2004, both cited by Berkowitz), suggests the efficacy of the Social Norms approach, it would also be useful to examine data while controlling for various factors, to see if the approach tends to have larger effects in certain demographic groups. This approach would provide information to interested parties that might allow them to adjust their campaign approaches accordingly so as to maximize efficacy.

CHAPTER 2

Theoretical Framework

Social Norms Theory

The earliest form of Social Norms Theory was introduced by H. Wesley Perkins and Alan D. Berkowitz (1986), who established the basic tenets of the theory and called for the need to utilize it to establish more effective alcohol intervention programs in colleges and universities. Since then, the theoretical framework itself has undergone very little change, but it has been referred to by several names, such as the Proactive Prevention Model, Social Norming, the Perceived Norms Model, Norms Correction, and the Norms Challenging Model. The dominant terms which have emerged to describe this perspective are Social Norms Theory, which refers the theoretical framework, and the Social Norms Approach, which refers to intervention programs based on Social Norms Theory. The essence of the approach is summarized by Berkowitz:

> The social norms approach provides a theory of human behavior that has important implications for health promotion and prevention. It states that our behavior is influenced by incorrect perceptions of how other members of our social groups think and react. For example, an individual may overestimate the permissiveness of peer attitudes and/or behaviors with respect to alcohol, smoking, or other drug use, or underestimate the extent to which peers engage in healthy behavior. The theory predicts that overestimations of problem behavior will increase these problem behaviors while underestimations of healthy behaviors will discourage individuals from engaging in them. Thus, correcting misperceptions of group norms is likely to result in decreased problem behavior or increased prevalence of healthy behaviors (Berkowitz 2004, p. 5)

The theory assumes the existence of a discrepancy between the "perceived norm" and the "actual norm," which Berkowitz refers to as a "misperception." It is this "misperception" which is the target of all intervention programs utilizing a Social Norms Approach. These programs attempt to close the alleged gap between perceived norms and actual norms, specifically via the distribution of information about normative behavior in an effort to alter the former to bear greater resemblance to the latter. Through such action, the perceptions, and as a result, targeted behaviors, among the target population can be changed. Thus, the Social Norms Approach deviates from prior forms of intervention strategy by focusing on strengthening particular attitudes which are found to already be characteristic of the majority of the populace. By contrast, the more traditional approach does not acknowledge desirable majority behavior and tends to focus on providing information about the negative consequences of the targeted minority behaviors and identifying/treating individuals who exhibit them (Berkowitz 2004, p. 5-6).

When Social Norms Theory was first introduced, it was used as an explanation for and a proposed means to combat alcohol abuse on college campuses. While alcohol and smoking appear to have consistently remained as the behaviors most commonly targeted by the Social Norms Approach, the scope of the approach has widened over the years to combat rape, sexual assault, and other behaviors.

Social Norms Theory derives its understanding of norms from Durkheim (1951) and Campbell (1964), acknowledging that group norms, defined as the dominant or typical behavior patterns of a particular group, have a regulative effect on the actions of individual group members, resulting in the perpetuation of the collective norm. Perkins explains:

> Indeed, norms can be powerful agents of control as "choices" of behavior are framed by these norms and as the course of behavior most commonly taken is typically in accordance with normative directives of "reference groups" that are most important to the individual. Although many persons think of themselves as individuals, the strong tendency of people to conform to group patterns and expectations is consistently documented in laboratory experiments, social surveys and participant observation of cultural contexts. (Perkins 2002, p. 164)

Perkins identifies several types of reference groups which are associated with college students, such as parents/family, school faculty, resident advisors, and peers. While it is obvious that parental values and norms are communicated to those making the transition into early adulthood, studies regarding the extent of the impact of such norms are limited. Those studies which do attempt to measure the effect of parental norms on college students (Lo 1995, cited by Perkins 2002) show only a minor effect of parental norms on student drinking behavior, albeit stronger in females than in males. There is, however, a correlation between problematic student drinking behavior and problematic parental drinking behavior, but this may be a combination of biological conditions (in the cases of children of alcoholics) and internalized parental norms. Also, it has been found that the normative influence of parents tends to be relatively small, compared to other reference groups, in the later high school years, which leads to the conclusion that this influence only continues to wane further after entry into college (Perkins 2002).

One study shows that school faculty members are more likely to confront a student regarding a drinking problem, particularly if said problem is affecting academic performance, than they are to confront one of their colleagues. That said, they are still

hesitant or ambivalent regarding the prospect of having to individually intervene in such a manner. Thus, Perkins acknowledges a high potential for faculty to exert a strong normative influence, but only via collective encouragement within the faculty community to establish intervention as an accepted standard. However, the presence of such initiatives, as well as a body of research to measure them, is virtually non-existent (Perkins 2002).

Residential Advisors are in a position to exert great amounts of influence over first-year college students, as RAs are usually their first contact with college culture. Furthermore, student drinking is an issue which RA's must face on a regular basis. However, interview data in a study by Rubington (1990) found that RA influence is not so much concerned with moderating student alcohol usage as it is with making sure that students engage in their drinking behavior behind closed doors and without disruption to fellow students, so as to not force RA's to have to intervene in an official capacity as enforcers of school regulations.

Peer reference groups are of particular interest to Social Norms Theory, as there is considerable support in the literature (Kandel 1980, 1985; Lo 1995, cited by Perkins 2002) for the assumption that peer groups have the strongest influence of any reference group on those in late adolescence, especially with regard to the use of alcohol and other substances. While peer norms are typically more permissive than norms imposed by other reference groups, Perkins adds that college students have a tendency to believe that their peers have more permissive attitudes about alcohol use than what is actually the case, and that, similarly, college students have a tendency to believe that their peers drink alcohol in far greater amounts than they actually do.

Behavior vs. Perception

Thus, a fundamental component of Social Norms Theory is the presence of a significant gap between perceived and actual behaviors within a populace, namely among peer groups. This concept of "misperception" has been further expanded since Social Norms Theory's inception, as Berkowitz has incorporated concepts introduced by other theorists. In the most current permutation of Social Norms Theory, three different forms of misperception are identified: pluralistic ignorance, false uniqueness, and false consensus (Berkowitz 2004, p 7).

Pluralistic ignorance, noted by Berkowitz as the most common form of misperception, occurs when one assumes that the opinions and attitudes of one's peers are different from one's own, when, in fact, they are similar. The term was first used by Krech and Crutchfield (1948, cited by Breed and Ktsanes), and was later used as a means of examining the tendency for overestimation of actual support for racial segregation amongst the American white population (Breed and Ktsanes 1961). For example, the results from a 1968 survey showed that, while 32% of Southerners favored racial segregation, 61% of them believed that the majority of the population favored segregation. The gap was even greater in certain other regions; in the Pacific Coast, only 9% favored segregation, while 42% believed that the majority of the population favored it. This overestimation among whites produced some very real consequences for the black population, such as a tendency among white business owners to not hire blacks, out of fear of disapproval from the majority of the white population (O'Gorman 1975). Thus, the concept of pluralistic ignorance is hardly new, but it does appear that Berkowitz may

have been the first to apply it to alcohol drinking behavior within the college student population. However, Berkowitz specifically attributes pluralistic ignorance to those who are occasional or moderate drinkers, and who mistakenly believe that their peers drink more than they actually do.

A second, completely separate category of misperception, which is very similar in character to pluralistic ignorance, is applied specifically to infrequent drinkers and abstainers by Berkowitz. This type of misperception is called false uniqueness. Like pluralistic ignorance, it describes the tendency to assume that the difference between oneself and other persons is greater than it actually is. However, since it is referring to a group of persons who believe themselves to be in the extreme minority, the sense of false uniqueness is believed to cause them to actually withdraw from society, thus contributing to the prevalence of a behavior by removing the source for the strongest possible opposition against it. As it relates to Social Norms programs specifically, false uniqueness is noted as the form of misperception responsible for keeping abstainers from being active in campus-life, as they perceive it to be more alcohol-oriented than it actually is (Berkowitz 2004, 8-9).

False Consensus is the third form of misperception, first referred to as the "false consensus effect" by Ross, Greene, and House (1977). This describes a tendency for one to overestimate the degree to which peers agree with one's own attitudes/opinions. This tendency is also applied to groups, such that a small group may acquire a particular attitude or opinion, which encounters little or no opposition from the larger population. Therefore, the smaller group will assume that the larger population outside the group also share or agree with said attitude or opinion. Berkowitz attributes this form of

misperception to heavy drinkers, who are motivated by a "self-serving bias" which allows them to justify their drinking practices by denying that their behavior and opinions are uncommon. This bias, when combined with the pluralistic ignorance of the population at large, allows those under false consensus to assume the roles of "subculture custodians," who have the ability to exert influence which expands far beyond their actual numbers, due to lack of opposition from a "silent majority" which underestimates its own numbers (Berkowitz 2004, p 7-8).

Types of Norms

Social Norms Theory acknowledges at least two pairs of norm types: one based upon personal preferences and behavior, and a more vague set of norm categories based upon social distance. While it is the aim of the Social Norms Approach to address and affect all types of norms, one concern is which norms should receive primary focus for the greatest effect.

The first two types of norms are referred to as "injunctive" and "descriptive." Injunctive norms are based upon personal moral convictions, beliefs, and perceived peer approval of behaviors. Descriptive norms are indicative of actual behavior in practice, regardless of personal belief or perceived approval. Several studies related to Social Norms Theory (Borsari and Carey 2003; Trockel, Williams, and Reis 2003) concluded that injunctive norms were of greater importance than descriptive norms in their effect upon drinking behavior. However, Berkowitz does acknowledge that, with the current body of research, it is still unclear as to which norm type should receive most attention in order to bring about change in behavior. Most successful programs utilizing the Social

Norms Approach tend to focus upon descriptive norms, though there is usually some attention to injunctive norms (Berkowitz 2004, p 12).

Some insight into this phenomenon may be found in a study by Bank et al (1985), which examined the effects of peer influence and parental influences upon internalized norms (which can be considered equivalent to injunctive norms, as the term refers to ones personal norms and standards of conduct, generally based upon morality) and instrumental norms (which can be considered equivalent to descriptive norms, as the term refers to behaviors based upon contact with others), in adolescents in multiple Western countries, including the US. The findings were consistent with the researchers' hypothesis that, in Western cultures, the process of learning to drink alcohol responsibly is considered to be a matter of personal choice and responsibility, and the influence from parents and peers was found to have minimal effect upon internalized norms. However, on the other hand, behavior of peers and parents was found to have a great effect on instrumental norms. This is to say, while peers do not influence personal belief, when actual practice came into conflict with personal belief, the pressure of peers/parents had a tendency to hold much greater sway over behavior. One possible explanation for this is that alcohol use has become much less of a moral dilemma during the past few decades. In any case, given these results, it should come as somewhat less of a surprise that the most successful Social Norms programs focus on the normative activity of drinking rather than the reinforcement of morality opposed to drinking.

The other categories of norms which are referenced by Berkowitz (2004), based on degrees of social distance, are "local norms" and "global norms." These categorizations are established, based upon research suggesting that the degree of

misperception increases along with the level of social distance (Borsari and Carey 2003; Thombs 2000). For example, individual persons may believe that the people in their own circle of acquaintances and friends drink more than they themselves do, and that people outside the friend circle drink to an even greater extent than those within it. The Social Norms Approach does not provide specific guidelines for which norms should take precedence in implementing programs, as the comparative strengths of local and global norms can vary wildly from place to place and group to group. However, Berkowitz has suggested that both bases be covered through a combination of small group-based interventions as well as community-wide media campaigns (Berkowitz 2004, p 13)

CHAPTER 3

Literature Survey

Initial Studies in "Social Norming"

The focus of the literature on Social Norms campaigns is related to the use of social norms information to influence particular behaviors, mostly regarding substance abuses of some form and mostly among college student populations. The literature is very relevant to the focus of this research about the effect of Social Norm campaigning on perceived and practiced alcohol use. There are also a few studies which examine application of the theory to other populations and/or other topics. The literature relating to substance abuse will be examined first.

An article by Perkins and Berkowitz (1986) is one of the earliest regarding the use of Social Norms theory pertaining to alcohol use. It addressed the issue of misperceptions among college students regarding drinking norms, and how this perception relates to actual drinking behavior. The authors conclude with the proposal that measures be taken to correct these misperceptions, and thus, influence drinking behavior. Most of the other pieces of literature, particularly those pertaining to college behavior utilize the ideas presented here as a starting point.

Perkins and Craig (2002), Johannessen et al. (1999), Haines (1996), and Haines and Spear (1996) all provide descriptions of social norms campaigns over a multi-year period, the first at Hobart and William Smith Colleges, the second at University of Arizona, and the third and fourth at Northern Illinois University. Most of the material in these works is devoted to describing and explaining the techniques and strategies used in

the campaigns. All make claims of significant decreases in what is termed as “binge drinking” behavior (5 drinks or more in one sitting for a male, 4 for a female), and an increase in the perception of there being less such activity occurring among the student populace.

The University of Arizona study claims a decrease of 29% in actual binge drinking over four years (Johannessen et al. 1999). Similarly, the WHS study claims a 30% decrease over the course of five years (Perkins and Craig, 2002). It also claims a significant decrease in the number of alcohol related arrests of students as being related to the social campaign.

According to the NIU study (Haines and Spear, 1996), the percentage of NIU students claiming to engage in binge drinking activity dropped from 44.8% to 27.7% over the years from 1989 to 1995 (the social norms based campaign began in 1990), while the general student perception of the percentage of binge-drinkers among the student population dropped from 69.3% to 42.9% in the same time period. This was compared to the implementation of a traditional strategy, which occurred in the years prior to the social norms campaign, which yielded only a negligible drop (69.7% to 69.3%). While the traditional strategy was only implemented for one year, the effect was significantly less than the first year effect upon implementation of the new campaign (69.3% to 57%). However, the results from this study could have been cause at least in part due to a number of unrecognized factors, such as the possibility that the cohorts of students who answered the surveys in 1988-1989 could have been very different from the ones that answered them in the following years. The results could have also been due to the cumulative effect of intervention programs at NIU.

A comprehensive study by DeJong et al (2006) attempted to measure the effect of programs utilizing social norms theory as their basis vs. other intervention programs by pairing 18 institutions, with one of each pair being a control group and the other being a similar institution which had implemented large scale social norms campaigns during the time period of the study. Pretest/post-test data taken from the years 2000 and 2003 showed that students of institutions that implemented social norms campaigns had significantly lower levels of alcohol consumption than the control groups.

Alternate Methods in Social Norms Studies

In an attempt to refute claims of possible response bias in the surveys used to assess the effects of the Social Norms Approach, some studies have incorporated alternate means of data collection to supplement survey data. A particularly noteworthy example of this was a study by Foss et al (2003) at University of North Carolina Chapel Hill, taking place from 1997 to 2002. This study is unique in that it involved the breath analysis of students interviewed as they were returning to their dormitories from 10pm to 3am over the course of twenty nights during each of the 1997, 1999, and 2002 fall semesters. Approximately 83% of the total sample (n=6,108) agreed to provide breath samples. The study reported that the percentage of students with a blood alcohol content of 0.05 or greater decreased from 18.6% to 15.1% from 1997 to 1999 and decreased again to 14.4% in 2002.

Perkins, Haines, and Rice (2005) compared longitudinal data (Spring 2000 through Spring 2003) from colleges that utilized a social norms approach with those that did not by analyzing data provided by the National College Health Assessment survey.

Only colleges with a survey sample size of at least 100 were used for this study, resulting in a database of 76,145 respondents from 130 institutions nationwide. As expected, the study found that the strongest predictor of personal alcohol consumption is the perception of the drinking norm, and that schools which utilized a social norms based approach to alcohol awareness were found to have significantly lower high-risk drinking levels than those that utilized other approaches. However, it should also be noted that only 8% of the institutions in the study utilized the former type of awareness program, due to the relative newness of the social norms approach. Furthermore, there was no means of examining and assessing the specific content of the alcohol education programs of any of the colleges in the sample.

Social Norms and Campus Subcultures

Other studies have examined college populations and controlled for other factors that might influence alcohol perceptions and behaviors. Of particular interest are the effect of Greek affiliation and place of residence. Studies by Baer (1994), Carter & Kahnweiler (2000), and Sher, Kenneth, & Nanda (2001) attempt to control for these variables, with the first observing place of residence (including fraternity/sorority houses) in general, and the second and third placing particular focus on Greek affiliation.

Baer (1994) found that those living in fraternity/sorority houses did perceive higher rates as the norm and reported perceiving less disapproval from peers of drinking every weekend. However, the difference was not considered statistically significant enough to support the researcher's hypothesis that living in a fraternity/sorority house facilitates different norm development or creates a completely different set of norms from

the student population at large.

Carter and Kahnweiler (2000) proposed a similar hypothesis about members of fraternities/sororities forming a separate subculture with different norms from the student population at large, as an explanation for lesser levels of program efficacy among Greek populations. The reasons given for this were as follows:

> 1. There is no predominant healthy drinking norm in this group, 2. students are influenced more by people within their personal networks than by people not in them, and 3. “binge drinking” is the norm in the Greek population. (since social norms programs assume that most students are not binge drinkers, then a major underpinning of the social norm approach is missing, if this is the case)” (Carter & Kahnweiler 2000, p 66).

As expected, Greeks reported perceiving other Greeks as drinking more heavily than non-Greeks. The perception of peer drinking was higher than self-reported drinking, as was the perception of the drinking habits of the respondents' closest friends, thus supporting the second proposition. A vast majority of the sample also identified themselves as binge drinkers, supporting the third proposition.

The Sher et al. (2001) study examined the drinking behaviors of Greeks three years after leaving college and found that drinking habits during college did not appear to extend into the post-college lifestyle. This would appear to support the hypothesis that increased drinking by Greeks may be due to the presence of different norms among this subgroup.

Also, a study by Neighbors et al (2008) concluded that the perceived approval of more immediate peer/friend groups, with which students interact with on a more regular

basis, have a far greater effect on personal alcohol use than the perceived approval and behavior of less proximal groups (such as “typical” students). Thus it stands to reason that any student subculture where there is perceived approval of alcohol use within the closer knit group may be more resistant to efforts to decrease alcohol use via the correction of misperceptions of typical student behavior.

Applications Beyond the Student Population

Studies by Wenzel (2001) and Cunningham et al. (2001) involve the application of social norms theory to non-student populations. This is important to the literature for the purpose of demonstrating external validity beyond populations of college students. The Wenzel study applies the theory to Australian tax-paying practices by administering questionnaires regarding tax-filing behaviors to a random sample of Australian taxpayers. It was found that most believed that other taxpayers tended to be less honest in their filing procedures than themselves. Following this data collection, normative information regarding taxpaying behaviors was sent to a group of the original sample, allowing the researchers to divide the taxpayers into groups based upon whether they received feedback and whether they only received the survey, with a control group of those who did not receive either the survey or feedback. It was found that the group that received feedback had significantly fewer deductions claimed than other groups. Of course, one problem with this research is the possibility that mainly only those with positive taxpaying behaviors might be willing to return their questionnaires.

In the experiment by Cunningham et al (2001), 6000 of the 9393 households in a middle class Toronto neighborhood were mailed a pamphlet providing information on

norms for alcohol use and risks associated with alcohol abuse. Then a random sample of the 9393 households was selected to be contacted via phone to be administered a survey. The telephone surveys assessed the respondent's drinking behaviors and perceived risk of having alcohol related health problems. The researchers kept track of which households had been sent the pamphlets and which had not. They found that those considered by the survey assessments to be problem drinkers who both perceived themselves to be at risk of alcohol related problems and also had been sent the pamphlet reported drinking less than those problem drinkers who had not been sent the pamphlet. As expected, there were no statistically significant differences in drinking behaviors found among those who weren't considered problem drinkers, regardless of whether or not they received the treatment. However this study is limited in that it was unable to observe the long-term effects of the treatment. The population sampled was also very homogenous, limiting its generalizability to other demographic groups.

Most of the above studies are limited by the fact that they collected data through self-reporting. Thus, there is no way to measure the actual behaviors that are practiced in each case. Also, in the case of studies of the effects of Social Norms campaigns over time, it may be difficult to draw a direct connection between the campaign and the changes in perceptions and behaviors, even with the use of a control group, since the cohort of students at the end of a several year period at any given university can be completely different from the cohort at that university at the beginning. However, use of a control group that runs concurrent with the experimental group is usually not possible, as Social Norms programs typically (as is the case at VCU) target all students.

CHAPTER 4

Data Collection and Campaign

The National College Health Assessment survey (which is organized by the American College Health Association) is administered to students at VCU during the Spring semester of each year in order to gather data for various health-related campaigns. This survey asks a variety of health behavior related questions, including questions about the respondents' own alcohol use and questions about the respondents' perception of the alcohol use of peers. The NCHA survey has provided the basis for all Social Norms research at VCU.

In order to obtain the sample this data collection period, undergraduate courses were randomly selected (from a list provided by the registrar), with an even distribution of 100, 200, 300, and 400 level courses, in an attempt to acquire a sample as representative of the VCU population as possible. However, were a few exceptions, with a small number of classes chosen based upon convenience, due to faculty affiliation with the Office of Health Promotion. The instructors of the randomly chosen courses were then contacted by an OHP representative in order to acquire permission to administer the surveys and to set an appointment date to do so. If the instructor did not grant permission or is otherwise unable to accommodate the OHP request, then another class from the master list was randomly chosen, and the process repeated.

Though NCHA data had been collected for several years prior, VCU's Office of Health Promotion did not implement its Social Norms campaign until 2002. The NCHA sample for that year was 810, but departmental goals of far greater sample sizes for

subsequent years were established in order to provide more adequate data for the campaign. In 2004, OHP was able to obtain sample size of 1510.

The Office of Health Promotion's social norms campaign was launched in the Fall of 2002, after a six month preparatory period. It was presented to students primarily in the form of posters, which were placed in hallways, classrooms, and bathroom stalls in all on-campus academic buildings. Literature was also periodically placed upon tables in dining areas. The primary message of the campaign was "VCU Students are Healthier than You Think", and was featured prominently in all associated materials, along with statistical data taken from NCHA results from surveys administered in February 2002. In summary, the campaign presented students with information that the majority of VCU students 1) drink 0-4 alcoholic drinks when they party, 2) do not smoke, and 3) have 0-1 sexual partners during the year. The campaign continued to follow a similar format in the years afterward, utilizing newer NCHA data as it was collected and analyzed.

CHAPTER 5

Methodology and Hypotheses

Focus

The plan for this study was to examine the NCHA data at VCU, regarding perceived drinking behaviors and self-reported behaviors, collected during 2002 and 2004, and determine whether or not student drinking perceptions and student alcohol usage was in line with the goals of the Social Norms-based campaign which was put into execution after the 2002 data collection period, and to determine whether or not the student responses are in line with various assumptions supported by the Social Norms Theory literature. Whether the former was the case or not was determined by observing whether or not the level of amount of perceived alcohol use decreased, along with personal alcohol use, when comparing the dataset from 2002 with the data from 2004. The latter was determined by controlling for the variables of sex and place of residence, in order to determine whether perceptions and personal usage were different along gender and residential lines, as supported by the literature.

The focus of this research was narrowed to only the applications of the Social Norms approach pertaining to the use of alcohol, even though the VCU campaign also addresses tobacco use and sexual behavior, since alcohol has been the primary thrust of the VCU Social Norms campaign. Students are most likely to be familiar with that particular element. Thus, it is the best element to examine when attempting to determine whether or not application of the theory correlated with self-reported habits of the student sample.

Limitations

The datasets were acquired from the VCU Office of Health Promotions' annual administration of the National Collegiate Health Assessment (NCHA). For this study, the datasets from 2002 and 2004 were examined. Due to the fact that this is secondary data, there are several limitations which had to be accepted as part of the research design:

While most of the classes selected for administration were done so randomly, at least a few of the classes were convenience samples, chosen due to the instructor's affiliation with OHP. It is possible that, in these cases, there may have been a sampling bias.

Similarly, the administrators of the NCHA were all OHP employees, usually with a direct connection to the Social Norms campaign. Depending upon how the classes were addressed by the administrator prior to handing out surveys, there may have been a slight bias produced from that as well, as students may have been influenced by the OHP employee about what answers to provide.

Since the format of the NCHA has not changed at all, results can be compared from year to year, with the accepted limitations mentioned above. An additional limitation inherent in all college campus studies over this range of time is the possibility that the cohort of students can change during the time period. However, the restriction of this study to a short span of years makes radical change unlikely, though possible.

Another limitation of this study is due to the fact that the gender ratio of the

NCHA sample for both 2002 and 2004 was not representative of the gender ratio of the total VCU population during these years. For both years, roughly 58% of the VCU populace was female. In either sample, females were over-represented, accounting for approximately 68% of the respondents.

It must also be noted that ethnicity was not examined in this study, and thus, the possibility of influence by ethnic background upon drinking perception and behavior is not taken into account. For example, there was a somewhat higher percentage of African-Americans in the 2002 sample than in the 2004 sample (27% and 20% respectively). African-Americans were slightly over-represented compared to the VCU population (which was 22.6% of the total) in 2002, while the percentage of African-Americans in the 2004 VCU population was approximately the same as in the 2004 sample.

The lack of a control group in this study must be taken into consideration when interpreting the data as well, as it prevents a firm causal relationship from being established between the treatment and the results, so one must be careful not to immediately conclude that any of the results were directly caused by the Social Norms campaign.

Preparation of Data

All data was read and assessed via the software application SPSS (version 14.0). The NCHA data was already in an SPSS readable format, so no data translation or entry was required, thought several variables were recoded, as will be explained later.

The first step in preparing the data for interpretation was to remove cases which included answers which can be considered to be outliers or to be of questionable veracity.

For this study, the same variable cut-off points were used which were used by Perkins, Haines, and Rice (2005). Cases in which respondents gave the following answers were omitted from the data set:

- Respondents claiming to have had more than 40 sexual partners over the last school year.
- Respondents claiming to be older than 70 years old.
- Respondents claiming to have drank alcohol for more than 24 hours during the last time that they "partied"/socialized.
- Respondents claiming to have had more than 30 drinks during the last time that they "partied"/socialized.
- Respondents claiming to have had the same as or a greater number of drinks than the number had during that which they had the last time that they "partied"/socialized more than 14 times over the previous two weeks.
- Respondents claiming to be taller than 84 inches or shorter than 54 inches.
- Respondents claiming to be heavier than 400 pounds or lighter than 90 pounds.
- Respondents claiming to have never used alcohol, but indicating (via answers to other questions) that they had been driving while drinking, or indicating that they have had five or more alcoholic drinks in one setting over the past two weeks.

The above parameters were applied to the following questions from the NCHA survey, with the question regarding height (Question #47) recoded to provide an answer in inches rather than feet and inches:

Question 12 – “The last time you “partied”/socialized, how many hours did you drink alcohol? State your best estimate.”

Question 13 – “The last time you “partied”/socialized, how many alcoholic drinks did you have? State your best estimate.”

Question 14 – “In the last two weeks, on how many occasions did you drink the same or more alcohol as indicated in item #13? State your best estimate.”

Question 20 – “Within the last school year, with how many partners, if any, have you had sex (oral, vaginal, or anal)?”

Question 45 – “How old are you?”

Question 47 – “What is your height in feet and inches?”

Question 48 – “What is your weight in pounds?”

Question 9d – “Within the last 30 days on how many days did you use alcohol?” Responses – Never used, Have used but not in last 30 days, 1-2 days, 3-5 days, 6-9 days, 10-19 days, 20-29 days, All 30 days

Question 11a – “Within the last 30 days did you drive after drinking any alcohol at all?” Responses – Not applicable/Don’t drive, Not applicable/Don’t drink, No, Yes

Question 11b – “Within the last 30 days did you drive after having 5 or more drinks?” Responses – Not applicable/Don’t drive, Not applicable/Don’t drink, No, Yes

Question 16 – “Think back over the last two weeks. How many times, if any, have you had five or more alcoholic drinks at a sitting?”

After these omissions were made, the remaining overall sample sizes for this study were 807 for the year 2002 (528 female, 270 male, 9 NA) and 1501 for the year 2004 (1002 female, 479 male, 20 NA).

Dependent Variables

The dependent variable for peer perception of alcohol use was measured using the following question on the NCHA survey:

> Question 15 – "How many alcoholic drinks do you think that the typical student at your school had the last time he/she "partied"/socialized?"

This variable was measured numerically, in the form of "number of drinks". Then they were recoded into ordinal variables, utilizing the following cut-points: "0-4 drinks", "5-6 drinks", and "7 or more drinks". These are identical to the cut-points used in the campaign materials of the VCU social norms campaign which serve to separate light drinking from moderately and heavy drinking. In all cases, a "drink" is defined as being the equivalent of a 12 oz. beer, a shot of liquor, a 4 oz glass of wine, or a mixed drink.

Personal alcohol usage was actually measured utilizing two variables. The first utilized NCHA Question #13 (shown previously) as a base, and measured usage in a numerical fashion mirroring the variable for peer perception, and then recoded into an ordinal variable in the same manner. However, since it was felt that merely examining the number of drinks that students reported drinking the last time they socialized might not provide an adequate picture of whether students are drinking to moderation within their personal limits, a separate supplementary variable was established to measure the level of intoxication that the respondent managed to attain during the last time that they socialized/"partied".

In order to create the variable for level of intoxication, the data regarding the number of drinks consumed (Question #13) was combined with data regarding the number of hours spent drinking during a the respondent's last session of

socializing/partying (Question #12), data regarding the respondent's weight (Question #48), and data regarding the respondent's sex:

Question 46 – Sex – "What is your sex?" Responses – Female, Male

The data from these questions were combined in order to calculate a variable for the BAC (blood alcohol content) level for each respondent. Thus, the approximate level of intoxication was able to be measured, despite differences in individual student physiology.

For the purposes of this study, this variable is divided into two category ordinal variable: "BAC of 0.08 or higher" and "BAC lower than 0.08". This is due to 0.08 being the legal cut-off point for determining intoxication. Due to valid answers for all of the component questions being required in order to calculate BAC, the sample sizes for this particular variable were reduced somewhat, with 652 in the year 2002 (446 females, 206 males) and 1332 in the year 2004 (897 females, 435 males).

The formula used for the calculation of BAC is a modified version of the Widmark formula, which was provided by the American College Health Association. This formula assumes an hourly BAC reduction of 0.017 (as alcohol is processed out of the blood over time), and is presented as follows:

Males - (((((23.36/((0.58*(Weight/2.2046))*1000)))*0.806)*100)*((Number of Drinks at Last Party*12)*0.045))-(Hours at Last Party*0.017)

Females - (((23.36/((0.49*(Weight/2.2046))*1000)))*0.806)*100)*((Number of Drinks at Last Party *12)*0.045))-(Hours at Last Party *0.017)

Independent Variables

The control variables of sex and place of residence were measured by using Question #46 (shown previously) and Question #54 on the NCHA:

> Question 54 – "Where do you currently live?" Responses – Campus residence hall, Off-campus housing, Fraternity or sorority house, Parent/guardian's home, Other university/college housing, Other

For the sake of simplification, and due to low sample sizes in the other categories, the only answers which were examined for Place of Residence were campus residence hall, off-campus housing, and parent/guardian's home. Sex, of course, was measured in terms of male and female categories. Finally, the year was measured by separating the data collected in Spring of 2002 from the data collected in Spring of 2004.

Hypotheses

The following hypotheses were presented:

1. Based upon the findings from articles in the literature review regarding the effects of social norms campaigning, it is expected that the survey results for will show a decrease in the level of alcohol usage perceived as the norm amongst the overall student populace, from 2002 to 2004.

2. It is expected, based upon the findings from the literature regarding the effects of social norms campaigning, that the survey results will show a decrease in the level of personal alcohol usage amongst the overall student populace, from 2002 to 2004.

3. It is also expected, based upon the findings from the literature regarding the effects of social norms campaigning, that the survey results will show a decrease in the level of intoxication amongst the overall student populace from 2002 to 2004.

4. Students that live off-campus will exhibit less of a decrease in the dependent variables 1-3 above (peer alcohol use perception, personal alcohol use, and intoxication level) from 2002 to 2004 than on-campus students and students who live with their parents. This is due to greater separation from forces such as the VCU Social Norms campaign and familial/parental influences, which may help to maintain the perception of more moderate norms. Off-campus students may also have more frequent access to a "party" subculture which promotes higher levels of alcohol use and intoxication, and thus, may also assume higher levels of use to be the norm amongst all students.

5. Males will exhibit less of a decrease in the dependent variables 1-3 above (peer alcohol use perception, personal alcohol use, and intoxication level) from 2002 to 2004 than females. This is based upon the assumption that males may tend to be more rebellious against normative influences than females, and thus, will assume that their peers behave in a like manner

6. Males that live off-campus will exhibit less of a decrease in the dependent variables 1-3 above (peer alcohol use perception, personal alcohol use, and intoxication level) from 2002 to 2004 than any other tested demographic group. This is due to the

previous assumptions pertaining to sex and place of residence.

7. Females that live on-campus will exhibit more of a decrease in the dependent variables 1-3 above (peer alcohol use perception, personal alcohol use, and intoxication level) from 2002 to 2004 than any other tested demographic group. This is due to the previous assumptions pertaining to sex and place of residence, with the additional assumption that living on-campus would provide greater exposure to Social Norms campaigning, and thus, would help facilitate a greater change in perception than would tend to occur amongst students living with their parents

Testing Methods

Hypotheses #1, #2, and #3 were tested by performing SPSS crosstabulations utilizing the entire student sample and examining levels of peer perception, number of drinks imbibed, and level of intoxication, separated by year (2002 and 2004) Since all of the variables involved are treated as ordinal, a Goodman-Kruskal Gamma test was used to determine strength, direction, and significance of any correlation between shifts in distribution in the dependent variables from 2002 to 2004. While it may be somewhat unorthodox to view year as an ordinal variable, it was felt that the Gamma test was still appropriate, as negative Gamma scores would indicate a downward shift in the reported perceptions/behaviors from 2002 to 2004, while positive scores would indicate an upward shift, with the value of the score indicating the degree of said shift. P-values of 0.05 or less were considered statistically significant, with P-values of 0.10 or less considered to be approaching significance. The assessment provided by the Gamma test was used to

determine whether or not the hypotheses are supported by the findings.

In order to test hypothesis #4, SPSS crosstabulations similar to the ones used to test the first three hypotheses were constructed. However, the sample was also controlled for place of residence, producing three separate analyses (on-campus students, students living with parents, and off-campus students). As before, the strength, direction, and significance of the relationships found in each of these analyses was assessed by the Goodman-Kruskal Gamma test, with P-values of 0.05 or less considered statistically significant. Then, the assessments provided by the Gamma of each student demographic group (based upon place of residence) were compared in order to examine differences in peer perception, number of drinks, and levels of intoxication among them, and determine whether the hypotheses are supported.

In order to test hypothesis #5, SPSS crosstabulations similar to the ones used to test hypothesis #4 were constructed, but, sex was controlled for instead of place of residence, producing two separated analyses, one for male behavior between 2002 and 2004, and the other for female behavior between 2002 and 2004. As before, the Goodman-Kruskal Gamma test was used to determine strength, direction, and significance, with P-values of 0.05 or less considered statistically significant. Then the analysis of correlations found within the male demographic was compared with that of the female demographic, in order to determine whether or not the hypotheses are supported.

In order to test hypotheses #6 and #7, SPSS crosstabulations were constructed, controlling for both sex and place of residence. This produced the following separate demographic groups: males who live on-campus, males who live off-campus, males who

live with their parents, females who live on-campus, females who live off campus, and females who live with their parents. As before, the behaviors (level of peer perception, number of drinks, and level of intoxication) of each demographic group from 2002 to 2004 was assessed separately via Goodman-Kruskal Gamma tests in the same manner as with the tests of the other hypotheses, with P-values of 0.05 or less considered statistically significant. Then the assessments of the demographic groups were compared in order to determine whether or not the hypotheses are supported.

CHAPTER 6

Results

Overall Perception, Alcohol Use, and Levels of Intoxication

When observing the entire NCHA sample, the perception of peer alcohol use changed drastically from 2002 to 2004, with an increase of approximately 18% among students perceiving the drinking norm to be 0-4 drinks. Accordingly, there was a 13.3% decrease in the highest drinking category (7 or more drinks). The Goodman-Kruskal Gamma test found this shift in perception from 2002 to 2004 to be statistically significant ($p = 0.000$). Thus, Hypothesis #1, which predicted a significant downward shift in the perception of peer alcohol usage from 2002 to 2004 amongst the overall student sample, was supported by the data.

Table 1:
Perceived number of drinks imbibed by peers when socializing in overall VCU NCHA sample in 2002 and 2004

		2002	2004
0 to 4 drinks	%	34.9	53.1
5 to 6 drinks	%	35.5	30.5
7 or more drinks	%	29.6	16.3
	Total *n*	780	1483

Gamma = -.327; Sig = 0.000

From 2002 to 2004, the percentage of students reporting drinking 7 or more drinks

when they socialize increased by 1.4%, while the lowest category of drinkers (0-4) decreased by 2.3%. However, it should be noted that, despite this slight increase in personal drinking behavior, students who reported drinking 0-4 drinks when socializing composed a majority of the overall populace in both years.

A Goodman-Kruskal Gamma test found this slight upward shift in drinking levels to be very weak (gamma = .042) and not significant. Thus, Hypothesis #2, which predicted a downward shift in personal drinking behavior, was not supported by the hypothesis, as the level of personal alcohol use remained fairly steady from 2002 to 2004.

Table 2:
Number of drinks imbibed when socializing in overall VCU NCHA sample in 2002 and 2004

		2002	2004
0 to 4 drinks	%	62.9	60.6
5 to 6 drinks	%	14.1	15.0
7 or more drinks	%	23.1	24.5
	Total *n*	789	1501

Gamma = .042; Sig = 0.297

Student intoxication levels in the overall NCHA sample only showed a minute downward shift from 2002 to 2004, lacking strength and significance. Thus, hypothesis #3, which predicted a significant decrease in intoxication levels from 2002 to 2004, was not supported by the data, as the level of student intoxication from 2002 to 2004 remained virtually unchanged.

Table 3:
Level of intoxication when socializing in overall VCU NCHA sample in 2002 and 2004

		2002	2004
BAC less than .08	%	61.4	61.7
BAC .08 or higher	%	38.6	38.3
	Total *n*	650	1340

Gamma = -.010; Sig = 0.836

Place of Residence and Perception

When controlling for place of residence, the sample sizes were decreased dramatically for both years. This, of course, caused greater difficulty in establishing statistical significance. Hypothesis #4, while implying a downward shift in the perception of alcohol use behavior amongst peers from 2002 to 2004 as per the goals of the VCU Social Norms Campaign, also predicted less of a downshift amongst off-campus students than amongst on-campus students and students who live with their parents. In order to test the correlation between place of residence and perception, the following data, as shown in Table 4, Table 5, and Table 6, were examined.

Table 4:
Perceived number of drinks imbibed by peers when Socializing among VCU students living in an on-campus residence, in 2002 and in 2004

		2002	2004
0 to 4 drinks	%	42.6	57.5
5 to 6 drinks	%	33.0	26.8
7 or more drinks	%	24.4	15.7
	Total *n*	176	440

Gamma = -.259; Sig = 0.001

There was a increase in the percentage (by approximately 15%) of students living on campus who perceived that the average student drinks only 0-4 alcoholic beverages when they socialize, while the perception that the average student has 7 or more drinks decreased by 8.7%. This shift was found to be significant by the Goodman-Kruskal Gamma test.

The perception of drinking behavior amongst students living off-campus showed a similar level of change from 2002 to 2004, with the lowest category of alcohol use showing a upward shift of almost 16%. As with on-campus students, the Goodman-Kruskal Gamma test found the changes in perception regarding alcohol use from 2002 to

2004 to be statistically significant, and slightly stronger than the perception shift among on-campus students.

Table 5:
Perceived number of drinks imbibed by peers when Socializing among VCU students living in an off-campus residence, in 2002 and in 2004

		2002	2004
0 to 4 drinks	%	32.2	48.1
5 to 6 drinks	%	36.7	33.3
7 or more drinks	%	31.1	18.6
	Total *n*	283	574

Gamma = -.292; Sig = 0.000

Among students living with their parents, there was also a downward shift in the perception of peer alcohol use; this perception shift was much stronger than that in other residence groups (gamma = -.452). From 2002 to 2004, this demographic group's perception that the average student drinks 7 or more drinks dropped by 19.6%. This shift in perception was found by the Goodman-Kruskal Gamma test to be statistically significant.

Within the off-campus and with-parents residential demographic groups in 2002, the highest percentage of students believed the middle drinking category (5-6 drinks) to be the social norm, while the lowest drinking category (0-4) was believed to be the social norm among on-campus students. Among off-campus students the distribution of

remaining students was split fairly evenly between the “0 to 4” and “7 or greater” categories, and this distribution changed very dramatically from 2002 to 2004, with the percentage of those believing 7 or more drinks to be the norm dropping by about 40%. Among on-campus students in 2002, the percentage of students answering in the lowest drinking category outnumbered those in the highest by 75%, and this gap widened in 2004 such that students perceiving 0-4 drinks to be the norm outnumbered those perceiving 7 or more as the norm by approximately 192%.

It is noteworthy that students living with their parents in 2002 had a percentage of their number perceiving that the average student drinks 7 or more drinks which was slightly greater than the percentage of off-campus students perceiving the same thing (32.4% to 31.1%), but this perception shifted so that, in 2004, the percentage of students living with parents who perceived this was 5.8% lower than the percentage of off-campus students with the same perception. Thus, the section of hypothesis #4 regarding place of residence and perception was found to be only partially supported, as it was found that off-campus students demonstrated a stronger downward shift in perception than on-campus students, but the strongest downward shift in perception was found to be among students living with their parents.

Table 6:
Perceived number of drinks imbibed by peers when Socializing among VCU students living with their parents, in 2002 and in 2004

		2002	2004
0 to 4 drinks	%	30.0	54.7
5 to 6 drinks	%	37.6	32.4
7 or more drinks	%	32.4	12.8
	Total *n*	214	324

Gamma = -.452; Sig = 0.000

Place of Residence and Alcohol Use

Hypothesis #4, as with its prediction regarding place of residence and the perception of alcohol use, also predicts less of a downward trend in alcohol use among off-campus students than in other residential groups, due to an assumed greater separation from alcohol education programs, and an assumed closer proximity to "party culture" than other residential demographic groups. The data examined to test the correlation between place of residence and personal alcohol use are shown in Table 7, Table 8, and Table 9.

There were slight differences in 2002 drinking patterns between on-campus and off-campus students, with on-campus students having a somewhat greater tendency to be in the 0-4 drink category, and off-campus students having a slightly greater tendency to be in the 5-6 drink or 7 or greater categories. From 2002 to 2004, the lowest drinking category (0-4) showed percentage decreases in both on-campus and off-campus groups,

while the highest drinking category (7+) showed increases, with the middle (5-6) showing upwards shifts (albeit less dramatic than the those within the highest drinking category) as well.

However, the upward shift among on-campus students was found to be far more powerful than for off-campus students. The shift among off-campus students was very weak (gamma = .047), and not statistically significant, while the shift among on-campus students was considerably stronger (gamma = .167) statistically significant (p=.046)

Table 7:
Number of drinks imbibed when socializing by VCU students living in an on-campus residence, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	69.8	61.0
5 to 6 drinks	%	9.5	13.4
7 or more drinks	%	20.7	25.6
	Total *n*	179	441

Gamma = .167; Sig = 0.046

Table 8:
Number of drinks imbibed when socializing by VCU students living in an off-campus residence, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	59.3	56.6
5 to 6 drinks	%	15.8	16.8
7 or more drinks	%	24.9	26.6
	Total *n*	285	583

Gamma = .047; Sig = 0.464

The drinking behavior amongst students living with their parents showed an upward shift in the lowest drinking category, with a much smaller upward shift in the highest category. There was a 3.8% increase in students who reported drinking 0-4 drinks, a 4.1% decrease in the "5 to 6 drinks" category, and a 0.4% increase in the "7 or more drinks" category. This demographic group still retained the highest percentage of students drinking 0-4 drinks in 2004, though students living with parents had trailed behind on-campus students in this category by 8% in 2002. By the same token, students living with parents retained the lowest percentage of "7 or greater" drinkers in 2004 though, in 2002, the percentage of with-parents students in this category was comparable to the percentage of on-campus students who were in this category.

Table 9:
Number of drinks imbibed when socializing by VCU students living with their parents, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	61.8	65.6
5 to 6 drinks	%	17.9	13.8
7 or more drinks	%	20.3	20.7
	Total *n*	212	334

Gamma = -.054; Sig = 0.507

The on-campus demographic group not only failed to show a decrease in personal drinking behavior, but showed significant increase in personal drinking behavior, while the off-campus students and with-parents students remained fairly steady, with only slight changes. Thus, the section of Hypothesis #4 regarding place of residence and personal alcohol use was not supported by the data.

Place of Residence and Levels of Intoxication

Hypothesis #4, assuming a reduction in personal alcohol use also naturally correlates to a reduction in levels of intoxication, also predicts less reduction among the off-campus student demographic group, due to greater separation from social forces which seek to moderate alcohol use and closer proximity to social forces which encourage excessive alcohol use. The data shown in Table 10, Table 11, and Table 12 were examined in order to test the correlation between place of residence and level of intoxication..

The results for levels of intoxication among on-campus students followed a trend similar to that found in that same demographic group when examining personal alcohol use (Table 7). The percentage of students living on-campus with a BAC calculation of less than .08 was the highest of all three demographic groups in 2002 (65%), but had dropped 4.5% by 2004. Despite this slight increase in intoxication levels among on-campus students from 2002 to 2004, this shift was not found by the Goodman-Kruskal Gamma test to be strong or statistically significant.

Table 10:
Level of intoxication when socializing, among VCU students living in an on-campus residence, in 2002 and 2004

		2002	2004
BAC less than .08	%	65.0	60.5
BAC .08 or higher	%	35.0	39.5
	Total *n*	160	394

Gamma = .095; Sig = 0.318

Off-campus students, though shown to be slightly more inclined than on-campus students to have greater intoxication levels in the first place, experienced a slight increase in intoxication levels by 0.7%. Though, the off-campus demographic group still maintained the highest level of intoxication in both years when compared to other groups, this minute upward BAC shift in off-campus students from 2002 to 2004 was shown by

the Goodman-Kruskal Gamma test to be even weaker (gamma = .016) than the shift among on-campus students.

Table 11:
Level of intoxication when socializing, among VCU students living in an off-campus residence, in 2002 and 2004

		2002	2004
BAC less than .08	%	58.8	58.0
BAC .08 or higher	%	41.3	42.0
	Total *n*	240	509

Gamma = .016; Sig = 0.837

Students living with their parents experienced a downward shift in intoxication levels from 2002 to 2004, following a very different trend from the on-campus and off-campus groups. Though still at a fairly weak level of strength (gamma = .113), this shift was still far stronger than the changes found in other residence groups. Following suit with the results pertaining to personal alcohol use levels (Table 9), students living with their parents maintained the lowest BAC level of any residential demographic group by 2004.

Table 12:
Level of intoxication when socializing, among VCU students living with their parents, in 2002 and 2004

		2002	2004
BAC less than .08	%	61.7	66.9
BAC .08 or higher	%	38.3	33.1
	Total *n*	193	300

Gamma = -.113; Sig = 0.236

As with the data pertaining to alcohol use, it was again found that the students living on-campus and off-campus both experienced increases from 2002 to 2004, while students living with parents tended to follow a different trend. Unlike the personal alcohol use data for residential groups, none of the findings regarding intoxication level and residential group were found to be statistically significant. However, the finds do still show that on-campus students experienced a stronger upward shift in intoxication than off-campus students did. Thus, the section of Hypothesis #4 regarding place of residence and level of intoxication, with its reliance upon on-campus students decreasing their levels of intoxication, or, at the very least, being more resistant to trends towards increased intoxication than off-campus students, was not supported by the data.

Gender and Perception

Hypothesis #5, predicted that there would be less of a decrease in the peer perception of alcohol use among VCU males than among females. The data from Table 13 and Table 14 were examined in order to test the correlation between gender and perception of alcohol use norms.

From 2002 to 2004, among VCU males, there was a dramatic decrease in the percentage of students perceiving 7 or more drinks to be the norm. This downward shift was found to be statistically significant.

Table 13:
Perceived number of drinks imbibed by peers when socializing, among VCU males in 2002 and 2004

		2002	2004
0 to 4 drinks	%	27.0	45.6
5 to 6 drinks	%	36.3	32.1
7 or more drinks	%	36.7	22.3
	Total *n*	259	467

Gamma = -.328; Sig = 0.000

The perceptions of VCU females also showed changes similar to males in direction, strength, and significance. However, the downward shift among females was slightly less powerful than the downward shift among males (gamma = -.328 for males; gamma = -.321 for females). Therefore, the section of Hypothesis #5 regarding gender and alcohol use perception was not supported by the data.

Table 14:
Perceived number of drinks imbibed by peers when socializing, among VCU females in 2002 and 2004

		2002	2004
0 to 4 drinks	%	38.9	56.3
5 to 6 drinks	%	35.0	30.1
7 or more drinks	%	26.1	13.6
	Total *n*	514	1001

Gamma = -.321; Sig = 0.000

Gender and Alcohol Use

Hypothesis #5 also predicted less of a decrease in personal alcohol use behaviors among VCU males than among females from 2002 to 2004. The data from Table 15 and Table 16 were examined in order to test the correlation between gender and personal alcohol use.

Among VCU males, there was a slight downward shift in alcohol use from 2002 to 2004, with a 2% decrease in the "7 or greater drinks" category.. However, this shift was not found to be lacking in strength and significance by the Goodman-Kruskal Gamma test.

Table 15:
Number of drinks imbibed when socializing by VCU males, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	47.1	49.8
5 to 6 drinks	%	12.3	11.7
7 or more drinks	%	40.6	38.6
	Total *n*	261	472

Gamma = -.045; Sig = 0.509

Even though the majority of the female population placed in the lower drinking category in either year, from 2002 to 2004 there was a noticeable increase in alcohol use among VCU females. The percentage of females in the "7 or greater drinks" category increased from 13.9% to 17.8%. Though this upward shift in drinking behavior was weak (gamma=.118), it was still found to be significant by the Goodman-Kruskal Gamma test. With the trend in VCU female alcohol use behavior from 2002 to 2004 being completely opposite of what was expected, and with males holding fairly steady, the section of Hypothesis #5 regarding gender and personal alcohol use was not supported by the data.

Table 16:
Number of drinks imbibed when socializing by VCU females, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	70.8	65.6
5 to 6 drinks	%	15.2	16.7
7 or more drinks	%	13.9	17.8
	Total *n*	519	1014

Gamma = .118; Sig = 0.024

Gender and Levels of Intoxication

Hypothesis #5 predicted less of a decrease in levels of intoxication among VCU males than VCU females from 2002 to 2004. In order to test the correlation between gender and level intoxication the data from Table 17 and Table 18 were examined.

Table 17:
Level of intoxication when socializing among VCU males, in 2002 and 2004

		2002	2004
BAC less than .08	%	56.6	64.2
BAC .08 or higher	%	43.4	35.8
	Total *n*	205	433

Gamma = -.158; Sig = 0.067

VCU males showed a decrease in levels of intoxication from 2002 to 2004, with BAC levels of 0.08 or higher dropping by 7.6%. This shift, although weak in strength, was found to be approaching significance by the Goodman-Kruskal Gamma test.

Table 18:
Level of intoxication when socializing, among VCU females, in 2002 and 2004

		2002	2004
BAC less than .08	%	63.6	60.7
BAC .08 or higher	%	36.4	39.3
	Total *n*	446	897

Gamma = .060; Sig = 0.309

VCU females, on the other hand, followed a trend in intoxication different to that of males, with a minute increase in levels of intoxication from 2002 to 2004. The percentage of VCU females with a calculated BAC of 0.08 or higher shifted upward by 2.9% in this time period. The Goodman-Kruskal Gamma test found this shift to be lacking in strength and significance, however.

As with the correlation between gender and personal alcohol use, the results turned out to run completely opposite of what was expected, with males decreasing in levels of intoxication and females holding fairly steady from 2002 to 2004. Therefore, the section of Hypothesis #5 regarding gender and level of intoxication was not supported by the data.

Place of Residence, Gender, and Perception

When controlling for both gender and place of residence, the sample sizes were reduced greatly, with n of less than 100 in some demographic groups. This should be taken into account when examining all such data, as statistical significance is far more difficult to establish with these smaller sample sizes.

Part of hypothesis #6, based upon the expectations of prior hypotheses, predicted that males who live off-campus will show the least amount of decrease in the perception of peer alcohol use, due to the combination of distance from social norms campaigning and of expected proclivities generally found to be characteristic of the male demographic group. Conversely, part of hypothesis #7 predicted that females who live on-campus will show the greatest decrease in peer alcohol use perception, due to proximity to social norms campaigning and due to expected proclivities generally found to be characteristic of the female demographic group. In order to test the correlation between place of residence, gender, and perception of alcohol use, the data from Tables 19-24 were examined.

The perception of peer alcohol use among on-campus males from 2002 to 2004 showed downward shifts in the middle and high categories. These changes were found by the Goodman-Kruskal Gamma test to be approaching statistical significance ($p = 0.059$).

Oddly enough, the perception of peer alcohol use among off-campus males from 2002 to 2004 actually followed a stronger downward trend (gamma = -.322 vs. -.239) than on-campus males, with the “7 or greater drinks” category dropping 16.2%. The changes within this demographic group from 2002 to 2004 were found to be statistically significant.

Table 19:
Perceived number of drinks imbibed by peers when socializing, among VCU males who lived on-campus in 2002 and 2004

		2002	2004
0 to 4 drinks	%	35.0	48.1
5 to 6 drinks	%	30.0	28.2
7 or more drinks	%	35.0	23.7
	Total *n*	60	131

Gamma = -.239; Sig = 0.059

Table 20:
Perceived number of drinks imbibed by peers when socializing, among VCU males who lived off-campus in 2002 and 2004

		2002	2004
0 to 4 drinks	%	26.1	43.0
5 to 6 drinks	%	33.0	32.3
7 or more drinks	%	40.9	24.7
	Total *n*	88	186

Gamma = -.322; Sig = 0.002

From 2002 to 2004, male students living with their parents also exhibited a downward shift in the perception of peer alcohol use, as the low drinking category increased by 25.1%. This shift was even stronger than that among off-campus males (gamma = -.434), and was found to be significant by the Goodman-Kruskal Gamma test.

Table 21:
Perceived number of drinks imbibed by peers when socializing, among VCU males who lived with parents in 2002 and 2004

		2002	2004
0 to 4 drinks	%	22.9	48.0
5 to 6 drinks	%	50.0	38.2
7 or more drinks	%	27.1	13.7
	Total *n*	70	102

Gamma = -.434; Sig = 0.000

The perception of peer alcohol use among female students living on-campus showed a downward shift towards the lowest drinking category, with a 15% increase in the number of students believing that their peers generally drink 0-4 alcoholic beverages when they socialize. This shift was found to be statistically significant.

Table 22:
Perceived number of drinks imbibed by peers when socializing, among VCU females who lived on-campus in 2002 and 2004

		2002	2004
0 to 4 drinks	%	46.6	61.6
5 to 6 drinks	%	34.5	26.1
7 or more drinks	%	19.0	12.4
	Total *n*	116	307

Gamma = -.261; Sig = 0.006

Females living off-campus followed a trend very similar to those living on-campus, with a shift upwards in the low drinking category, accompanied by decreases in the center and high categories. The shift with off-campus females was slightly stronger than with on-campus females, however. As was the case with on-campus females, the changes in perception among female off-campus students from 2002 to 2004 were found to be statistically significant.

Table 23:
Perceived number of drinks imbibed by peers when socializing, among VCU females who lived off-campus in 2002 and 2004

		2002	2004
0 to 4 drinks	%	34.9	50.6
5 to 6 drinks	%	38.5	33.8
7 or more drinks	%	26.7	15.6
	Total *n*	195	385

Gamma = -.288; Sig = 0.000

Females living with their parents showed a strong shift downwards in their perception of peer alcohol use behavior from 2002 to 2004, with a 22.6% decrease among students perceiving 7 drinks or greater to be the norm. This demographic group had the strongest downward shift in perception (gamma = -.459) out of all of the gender/residence

groups. Thus, the Goodman-Kruskal Gamma test found this shift to be statistically significant.

Table 24:
Perceived number of drinks imbibed by peers when socializing, among VCU females who lived with parents in 2002 and 2004

		2002	2004
0 to 4 drinks	%	33.6	57.8
5 to 6 drinks	%	31.5	29.8
7 or more drinks	%	35.0	12.4
	Total *n*	143	225

Gamma = -.459; Sig = 0.000

Since the perception of peer alcohol use among off-campus males and females actually shifted downward to a greater degree than on-campus males and females, the data did not support the section of hypothesis #6 regarding perception. On-campus females showed a greater downward shift in the perception of alcohol use than on-campus males, but the shift in this group was not stronger than the downward shift among males in the other two residential demographic groups. Females living with their parents, however, showed the strongest downward shift in perception out of all groups. Therefore, the data did not support Hypothesis #7, which predicted that on-campus females would show the strongest downward shift in perception.

Place of Residence, Gender, and Alcohol Use

Hypothesis #6 predicted that males who live off-campus will show the least amount of decrease in amount of personal alcohol use, in terms of number of drinks, due to the combination of distance from social norms campaigning and of expected proclivities generally found to be characteristic of the male demographic group. Conversely, Hypothesis #7 predicted that females who live on-campus will show the greatest decrease in personal alcohol usage, due to proximity to social norms campaigning and due to expected proclivities generally found to be characteristic of the female demographic group. In order to test the correlation between residence, gender, and personal alcohol use, the data from Tables 25-30 were examined.

Males living on-campus showed a 5.6% increase from 2002 to 2004 in the highest category of alcohol use. The Goodman-Kruskal Gamma test found this minute shift to be very weak and insignificant.

Table 25:
Number of drinks imbibed when socializing by VCU Males who lived on-campus, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	50.0	48.8
5 to 6 drinks	%	14.5	10.1
7 or more drinks	%	35.5	41.1
	Total *n*	62	129

Gamma = .060; Sig = 0.656

Male students living off-campus also showed only a very slight upward shift in alcoholic use from 2002 to 2004, with the upper category (7 or more drinks) increasing by 0.8%. The Goodman-Kruskal Gamma test found this upward shift to be even weaker than the shift among on-campus students.

Table 26:
Number of drinks imbibed when socializing by VCU Males who lived off-campus, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	44.9	42.4
5 to 6 drinks	%	13.5	15.2
7 or more drinks	%	41.6	42.4
	Total *n*	89	191

Gamma = .032; Sig = 0.776

Conversely, among VCU males who lived with their parents, there was a downward shift in alcohol use from 2002 to 2004, with the percentage of students in the upper category (7 or greater drinks) decreasing by 7.4%, and the middle category (5-6 drinks) showing a decrease of 8.2%. In 2004, almost 64% males living with their parents reported drinking 0-4 alcoholic beverages when they last socialized. As with other gender-residence groups, the sample sizes were quite small (n = 69 in 2002 and n = 104 in 2004), so the Goodman-Kruskal Gamma test did not find this shift to be statistically significant, but it did find the changes in this demographic group to be approaching significance (p = 0.088). However, this shift in alcohol use was still the second strongest

among all residence-gender groups (gamma = -.236).

Table 27:
Number of drinks imbibed when socializing by VCU Males who lived with parents, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	47.8	63.5
5 to 6 drinks	%	13.0	4.8
7 or more drinks	%	39.1	31.7
	Total *n*	69	104

Gamma = -.236; Sig = 0.088

Among females living on-campus, there was an upward shift in personal alcohol use from 2002 to 2004, with a 6.2% increase in on-campus females drinking 7 or more drinks, and a 8% increase in on-campus females drinking 5 to 6 drinks. The Goodman-Kruskal Gamma test found this to be the strongest upward shift found in any of the demographic groups in this entire study (gamma =.314). Accordingly, this shift was also found to be statistically significant.

Table 28:
Number of drinks imbibed when socializing by VCU females who lived on-campus, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	80.3	66.1
5 to 6 drinks	%	6.8	14.8
7 or more drinks	%	12.8	19.0
	Total *n*	117	310

Gamma = .314; Sig = 0.004

Off-campus females remained fairly steady in their drinking behaviors, with only a 1.2% increase in those drinking 7 or more drinks. This minute shift lacked strength and significance.

Table 29:
Number of drinks imbibed when socializing by VCU females who lived off-campus, in 2002 and 2004

		2002	2004
0 to 4 drinks	%	65.8	63.8
5 to 6 drinks	%	16.8	17.7
7 or more drinks	%	17.3	18.5
	Total *n*	196	389

Gamma = .041; Sig = 0.623

VCU Females living with their parents also showed a slight upward shift in personal drinking behavior. Unexpectedly, this shift was actually slightly stronger than the shift among off-campus females. However, as with the changes in drinking behavior among off-campus females, the Goodman-Kruskal Gamma test found the shift in behavior among female students living with their parents to be very weak and not statistically significant.

Table 30:
Number of drinks imbibed when socializing by VCU females who lived with parents in 2002 and 2004

		2002	2004
0 to 4 drinks	%	68.5	66.5
5 to 6 drinks	%	20.3	17.8
7 or more drinks	%	11.2	15.7
	Total *n*	143	230

Gamma = .065; Sig = 0.526

Since the only demographic group controlled by residence and gender to show any decrease in upper tier alcohol use behaviors was the group of males living with parents, The section of hypothesis #6 regarding personal alcohol use was not supported by the data. Also, since females living on-campus turned out to show the highest rate of increase in alcohol use of any other demographic group, the data did not support the corresponding section of Hypothesis #7 either.

Place of Residence, Gender, and Levels of Intoxication

Based upon the expectation that off-campus males would exhibit the least amount of decrease in amount of personal alcohol use in terms of number of drinks, Hypothesis #6 predicted that there would also be a matching trend in levels of intoxication. This is due to the combination of distance from social norms campaigning and of expected proclivities generally found to be characteristic of the male demographic group. Conversely, Hypothesis #7 predicted that females who live on-campus will show the greatest decrease in intoxication levels, also due to proximity to social norms campaigning and due to expected proclivities generally assumed to be characteristic of the female demographic group. In order to test the correlation between gender, place of residence, and level of intoxication, the data from Tables 31-36 were examined.

Both the on-campus and off-campus male demographic group exhibited slight downward shifts from the higher to lower BAC tiers from 2002 to 2004. The latter group showed a decrease in BAC levels of 0.08 or higher by 4.7%, which was a stronger shift than that of the former group, which decreased by 1.2%. The Goodman-Kruskal Gamma test found these shifts to be lacking in strength and significance, however.

Table 31:
Level of intoxication when socializing among VCU Males who lived on-campus, in 2002 and 2004

		2002	2004
BAC less than .08	%	58.5	59.7
BAC .08 or higher	%	41.5	40.3
	Total *n*	53	124

Gamma = -.025; Sig = 0.883

Table 32:
Level of intoxication when socializing among VCU Males who lived off-campus, in 2002 and 2004

		2002	2004
BAC less than .08	%	55.4	60.1
BAC .08 or higher	%	44.6	39.9
	Total *n*	74	168

Gamma = -.096; Sig = 0.495

Males who lived with their parents showed a much stronger decrease in levels of intoxication, with a downward shift of 13.9% into the lower BAC tier. The Goodman-Kruskal Gamma score of -.300 suggests a fairly moderate change (and a far stronger one than in other demographic groups), and the shift was found by the test to be approaching significance ($p = 0.071$)

Table 33:
Level of intoxication when socializing among VCU Males who lived with parents in 2002 and 2004

		2002	2004
BAC less than .08	%	58.1	72.0
BAC .08 or higher	%	41.9	28.0
	Total *n*	62	100

Gamma = -.300; Sig = 0.071

As with personal alcohol use levels, the on-campus female group also showed a complementary increase in levels of intoxication, with a 7.3% increase in 2004 among females calculated as having a BAC of 0.08 or higher. Though not found to be statistically significant, this change was the strongest upward shift in BAC of all demographic groups (as well as the second strongest shift in either direction).

Table 34:
Level of intoxication when socializing among VCU females who lived on-campus, in 2002 and 2004

		2002	2004
BAC less than .08	%	68.2	60.9
BAC .08 or higher	%	31.8	39.1
	Total *n*	107	289

Gamma = .159; Sig = 0.171

Off-campus females, who showed a 3.3% increase from 2002 to 2004 in intoxication level, followed a trend much weaker than that among on-campus females.

Table 35:
Level of intoxication when socializing among VCU females who lived off-campus, in 2002 and 2004

		2002	2004
BAC less than .08	%	60.2	56.9
BAC .08 or higher	%	39.8	43.1
	Total *n*	166	341

Gamma = .069; Sig = 0.471

Females living with their parents showed a minute downward shift in intoxication levels in 2004, with only a 1% decrease in the proportion of respondents with BAC levels calculated at 0.08 or higher. Thus, the demographic group remained fairly steady from 2002 to 2004.

Table 36:
Level of intoxication when socializing among VCU females who lived with parents in 2002 and 2004

		2002	2004
BAC less than .08	%	63.4	64.4
BAC .08 or higher	%	36.6	35.6
	Total *n*	131	208

Gamma = -.023; Sig = 0.843

The trends for levels of intoxication amongst the gender/residence based groups tended to follow along with the trends in personal alcohol use within the same groups. On-campus males decreased in intoxication levels by a lesser percentage than off-campus males and males living with parents. Thus, the section of Hypothesis #6 regarding levels of intoxication was not supported by the data. On-campus females, rather than showing the greatest decrease in intoxication levels, showed the greatest increase out of any of the demographic groups, so the corresponding section of Hypothesis #7 was also not supported by the data.

CHAPTER 7

Discussion

Changes in Perception of Alcohol Use

The changes in the perception of alcohol use from 2002 to 2004 among the overall student population, as well as among demographic groups controlled by gender and place of residence, are summarized in Table 37.

Among the total sample, as well as among all demographic groups controlled for gender and/or place of residence, the perception that the average student drinks 0 to 4 drinks when they socialize increased. For all groups, this shift in perception was found to be either statistically significant or approaching significance.

When the sample was controlled by gender, the perception shift among males was slightly stronger than the shift among females. This result was opposite of what was anticipated in the hypotheses.

When controlled by place of residence, students living with their parents showed the strongest shift in perception, while students living on-campus showed the weakest. Among the residence/gender control groups, females living with parents showed the strongest shift in perception, followed closely by males living with parents. Males living on-campus showed the weakest shift in perception, with females living on-campus having the second weakest shift in perception. These results were not congruent with the predictions made by the hypotheses that off-campus students would have the weakest shift in perception and that on-campus females would have the strongest.

Table 37:
Summary of Percent Change in Perception of Average Drinking Behavior Among Demographic Groups

Independent Variable Category	Percent Change (2004 minus 2002)			Test Scores	
	0-4 Drinks	5-6 Drinks	7+ Drinks	Gamma	p-value
Living On-campus	+14.9	-6.2	-8.7	-.259	.001*
Living Off-campus	+15.9	-3.4	-12.5	-.292	.000*
Living With Parents	+24.7	-5.2	-19.6	-.452	.000*
Males	+18.6	-4.2	-14.4	-.328	.000*
Females	+17.4	-4.9	-12.5	-.321	.000*
Males Living On-campus	+13.1	-1.8	-11.3	-.239	.059**
Males Living Off-campus	+16.9	-0.7	-16.2	-.322	.002*
Males Living With Parents	+25.1	-11.8	-13.4	-.434	.000*
Females Living On-campus	+15.0	-8.4	-6.6	-.261	.006*
Females Living Off-campus	+15.7	-4.7	-11.1	-.288	.000*
Females Living With Parents	+24.2	-1.7	-22.6	-.459	.000*
Total Sample	+18.2	-5.0	-13.3	-.327	.000*

* significant at 0.05 level **approaching significance (0.05 ≤ 0.10)

Changes in Reported Alcohol Use Behavior

The changes in reported alcohol use from 2002 to 2004 among the overall student population, as well as among demographic groups controlled by gender and place of residence, are summarized in Table 38.

Table 38:
Summary of Percent Change in Reported Drinking Behavior Among Demographic Groups

Independent Variable Category	Percent Change (2004 minus 2002)			Test Scores	
	0-4 Drinks	5-6 Drinks	7+ Drinks	Gamma	p-value
Living On-campus	-8.8	+3.9	+4.9	.167	.046*
Living Off-campus	-2.7	+1.0	+1.7	.047	.464
Living With Parents	+3.8	-4.1	+0.4	-.054	.507
Males	+2.7	-0.6	-2.0	-.045	.509
Females	-5.3	+1.5	+3.9	.118	.024*
Males Living On-campus	-1.2	-4.4	+5.6	.060	.656
Males Living Off-campus	-2.5	+1.7	+0.8	.032	.776
Males Living With Parents	+15.7	-8.2	-7.4	-.236	.088**
Females Living On-campus	-14.2	+8.0	+6.2	.314	.004*
Females Living Off-campus	-2.0	+0.9	+1.2	.041	.623
Females Living With Parents	-2.0	-2.5	+4.5	.065	.526
Total Sample	-2.3	+0.9	+1.4	.042	.297

* significant at 0.05 level **approaching significance (0.05 ≤ 0.10)

Among the total sample, student drinking behavior remained mostly steady from 2002 to 2004, with a slight (not significant) increase. When the sample was controlled by gender, drinking behavior among males changed very little, with a slight (not significant) decrease in personal alcohol use. Female alcohol use, however, increased significantly.

When controlled by place of residence, the on-campus group exhibited an upward shift in alcohol use, which was found to be statistically significant. Off-campus alcohol use remained fairly steady, with a slight (not significant) increase, while students living with parents exhibited the opposing end of the same trend; alcohol use remained mostly steady, but with a slight decrease.

Among the gender/residence groups, the only group which increased alcohol use to a statistically significant degree was the on-campus female demographic group. The only gender/residence group which exhibited a decrease in personal alcohol use was the males living with parents group. The changes among this group were found to be approaching significance ($p = 0.088$). All other groups remained fairly steady in their alcohol use, with very minor (not significant) increases.

Changes in Level of Intoxication

The changes in level of intoxication from 2002 to 2004 among the overall student population, as well as among demographic groups controlled by gender and place of residence, are summarized in Table 39.

Table 39:
Summary of Percent Change in Level of Intoxication Among Demographic Groups

Independent Variable Category	Percent Change (2004 minus 2002)		Test Scores	
	BAC < 0.08	BAC ≥ 0.08	Gamma	p-value
Living On-campus	-4.5	+4.5	.095	.318
Living Off-campus	-0.7	+0.7	.016	.837
Living With Parents	+5.2	-5.2	-.113	.236
Males	+7.6	-7.6	-.158	.067**
Females	-2.9	+2.9	.060	.309
Males Living On-campus	+1.2	-1.2	-.025	.883
Males Living Off-campus	+4.7	-4.7	-.096	.495
Males Living With Parents	+13.9	-13.9	-.300	.071**
Females Living On-campus	-7.3	+7.3	.159	.171
Females Living Off-campus	-3.3	+3.3	.069	.471
Females Living With Parents	+1.0	-1.0	-.023	.843
Total Sample	+0.5	-0.5	-.010	.836

* significant at 0.05 level **approaching significance (0.05 ≤ 0.10)

Among the overall student population, there was no significant change in level of intoxication level. Among gender-controlled groups, males showed a decrease in

intoxication level which approached significance, while females remained mostly steady in their intoxication levels. Among residence-controlled groups, on-campus students showed a slight (but weak) increase, while off-campus student intoxication levels remained virtually unchanged. Students living with parents decreased in intoxication level, but not by a significant amount.

None of the gender/residence controlled groups exhibited noteworthy change in intoxication level, except for males who live with their parents, who decreased at a level which approached significance (gamma = -.300; p = .071). The only gender/residence groups which showed any increase in intoxication level were on-campus females and off-campus females. Of the two, on-campus females had the highest gamma score (gamma = .159).

Conclusions

As stated earlier, it is very difficult to draw any sort of causal relationship between the VCU Social Norms alcohol education program and the alcohol perception and alcohol use levels of students, due to the presence of a variety of other uncontrolled factors which also might have had an effect on perception and behavior. However, it can be said that, from 2002 to 2004, change in reported perception of peer alcohol use was congruent with the goals of VCU's Office of Health Promotion for all of the observed demographic groups. However, even though the perception that most students only drink 0-4 drinks when they party showed an increase among all demographic groups, this reported shift in perception was not mirrored by reported behavior.

As for reported alcohol use, most of the demographic groups reported only slight

(and not significant) increases in alcohol use from 2002 to 2004. There were two major exceptions: females who lived on-campus greatly increased their alcohol use, and males who lived with their parents greatly reduced their alcohol use. Intoxication levels also followed suit with alcohol use, with on-campus females showing the strongest increase among residence/gender groups, and males living with their parents showing the greatest decrease.

Thus, it seems that, between 2002 and 2004, there may have been social forces of some kind at work which encouraged females in particular to drink greater amounts of alcohol, as there were increases in every female residence demographic group that tended to be more dramatic than changes in similar male residence demographic groups. This trend held even for students living with their parents, which was the demographic group least inclined to partake in higher tier alcohol use.

In contrast, males who lived with their parents exhibited behavior that was most congruent with the goals of the social norms campaign. This finding is compatible with the above supposition, as the males-living-with-parents demographic group would have the least exposure to on-campus forces that encourage high-tier drinking behavior by virtue of its location, while also not being the object of any social forces that specifically target females by virtue of its gender.

Also, while off-campus drinking was still at higher levels than on-campus drinking, there seemed to be social forces of some kind which encourage on-campus students to align their behaviors to more closely fit with the behaviors of off-campus students.

One factor that calls this supposition into question is the composition of the on-

campus student sample. VCU is known to have students hailing from a wide range of age groups. If a significant number of older students are in the on-campus sample, then it could skew the results towards higher-tier drinking behavior. In order to check to see if this might be the case, the on-campus samples for 2002 and 2004 were separated by age group in order to observe their age compositions. The result is summarized below in Table 40.

Table 40:
Age composition of 2002 and 2004 student samples

Age categories		2002	2004
Under 21 years	%	61.8	61.5
21 – 24 years	%	27.2	29.1
25 and older	%	10.9	9.4
Total *n*		749	1469

In either year, students of legal drinking age composed over one-third of the total sample. While this is a relatively small percentage of the student population, it could be significantly large enough to exert a disproportionate amount of influence over the student population at large as a visible and vocal minority.

However, this line of inquiry presents the question of whether the assumption is correct that the drinking behavior of students who are of legal drinking age tends to follow a different trend from the drinking behavior of students who are under 21. In order

to answer this question, as it pertains to the VCU NCHA samples for 2002 and 2004, overall student drinking behavior results (Question 13) were controlled by age group. The results are summarized in Tables 41 and 42 below.

Table 41:
Crosstabulation of number of drinks imbibed and age categories among VCU students in 2002.

		Under 21	21-24	25 and older	All
0 to 4 drinks	%	61.2	60.7	78.8	63.0
5 to 6 drinks	%	12.9	18.9	11.3	14.3
7 or more drinks	%	25.9	20.4	10.0	22.7
Total *n*		459	201	80	740

Gamma = -.153; Sig = 0.014

Table 42:
Crosstabulation of number of drinks imbibed and age categories among VCU students in 2004.

		Under 21	21-24	25 and older	All
0 to 4 drinks	%	60.4	58.6	65.7	60.3
5 to 6 drinks	%	14.4	15.8	17.9	15.2
7 or more drinks	%	25.2	25.5	16.4	24.5
Total *n*		893	423	134	1450

Gamma = -.028; Sig = 0.525

As it turned out, there was a negative correlation between drinking activity and age. This correlation was far stronger in 2002 than in 2004, which would indicate an increase in upper tier drinking behavior from 2002 to 2004 among students who are of legal drinking age. Students of legal drinking age at VCU were far more likely to live off campus, composing approximately 10% of the on-campus portion of the sample and approximately 60% of the off-campus group. Thus, the geography of VCU may provide a key element to providing an explanation for the resistance of the overall student body towards aligning behavior with changing perception.

Unlike more insular campuses, Many of VCU's students who live in off-campus housing tend to live within a relatively wide expanse of area immediately adjacent to the university, and thus, immediately accessible to on-campus students. While on-campus students obviously were exposed, at least to a certain extent, to the Social Norms campaign between 2002 and 2004, they would have also had constant exposure to older off-campus students who may partake in a "party subculture" and who quite probably live within an easily accessible distance from campus. While this "party subculture" may be, as the findings show, a minority within a minority, it seems likely that the members of this subculture, specifically those of legal drinking age, would be in a position to host gatherings and events which would allow such a minority to consolidate and reinforce their own norms, while also allowing younger on-campus students easy access to alcoholic beverages.

Perhaps it is more useful to examine this phenomenon in terms of conflict theories. When examining the Social Norms Approach from this perspective, one can classify the proponents of Social Norms Theory as a form of interest group (pursuing the

interest of moderating college alcohol usage), which utilizes the Social Norms Approach to create conflict groups (the groups that will exert the power and influence to directly oppose the alcohol-using subculture) on campus. The most obvious means of creating conflict groups is by consolidating and solidifying those of the college population who are said to be affected by "false uniqueness". Since this particular demographic is believed to be composed primarily of abstainers who feel alienated from campus culture, then consolidating them into larger groups gives them power and voice, fueled by a media campaign which brings attention to the problem of alcohol abuse on campus (albeit in a somewhat roundabout way, as the overt focus is on the solidification of the non-drinking norm, with an indirect aim of decreasing the apparent influence of the "party subculture"). It also seems reasonable that, through proper application of the media campaign, the more moderate elements of the college population can be swayed into a less tolerant position. It was also be suggestible for any such media campaign to attempt to make female students a particular focus, as that appears to be the group most heavily targeted by opposing social forces.

This classification of the Social Norms Approach as a power struggle doesn't seem too out of line, considering that in at least one study (Granfield 2000), the Social Norms Approach was acknowledged as a failure due to the inability to overcome fraternity influence, as the fraternities had developed a siege mentality, fighting back with increased effort against perceived threats from the administration to their culture. The case of VCU may be similar, although obviously far more passive insomuch as there doesn't appear to be any sort of active counter-campaigning. It does certainly seem that the level of exposure to the campaign's message was not sufficient to induce desired

changes.

Another possible factors which could also contribute to a lack of behavioral change from 2002 to 2004 would be that the social norms campaign had yet to become fully saturated within the VCU populace at a sufficient level by 2004 to yield significant changes in behavior, requiring more time than the span of this study in order for the message of the social norms campaign to become internalized within the populace to an extent that significant changes in behavior would result. Though there was a shift in perception among VCU students, it seems plausible that further application of social norms campaigning over time would be required in order to cause behavior to fall in line with reported perception. This suspicion is supported by the literature, which has found injunctive norms to have greater bearing upon personal alcohol use behavior than descriptive norms. Since the campaign focused primarily upon descriptive norms, making known the behavior of the 'typical student', it might have had difficulty in causing significant change within a short time-span among those students for whom greater levels of drinking are an injunctive norm, especially if the norm exists among peer groups with a high frequency of interaction and close association.

On the other hand, there is also support for the possibility that the results of the first two years of the VCU social norms campaign actually yielded comparatively positive results within the given time period. The study by DeJong et al showed that institutions with social norms programs showed relatively small changes in alcohol use behavior during the examined three-year period, ranging from a 1.1% decrease to a 10.6% increase. Conversely, the institutions that lacked social norms programs showed increases in alcohol-use behavior that ranged from 17.5% to 24.7% (DeJong et al, 2006).

Finally, it must also be noted that the over-representation of females in the NCHA samples may have had an effect upon the data produced. It is also possible that ethnicity, which was not examined as part of this study, may have also produced a confounding effect upon the results.

It would of interest to examine the VCU NCHA data from 2005 onward. Virginia Commonwealth University did receive a 2008 award from the U.S. Department of Education for having an exemplary, effective, or promising alcohol prevention program, so it is quite apparent that, via campaigning over time and/or increased market saturation, the VCU Wellness Resource Center has been able to more effectively reach the VCU population in the years since 2004.

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